DOCUMENT RESUME

ED 117 979 FL 007 447

AUTHOR Stokoe, William C.
TITLE Signing Apes and Evolving Linguistics.
PUB DATE 30 Aug 75
NOTE 13p.

EDRS PRICE MF-$0.83 HC-$1.67 Plus Postage
DESCRIPTORS *Animal Behavior; *Communication (Thought Transfer); Evolution; *Language; Language Patterns; *Linguistics; Manual Communication; Nonverbal Communication; Primatology; *Sign Language; Verbal Communication
IDENTIFIERS *Chimpanzees

ABSTRACT

Linguistics retains from its antecedents, philology and the study of sacred writings, some of their apologetic and theological bias. Thus it has not been able to face squarely the question how linguistic function may have evolved from animal communication. Chimpanzees' use of signs from American Sign Language forces re-examination of language origins and the evolution of progressively more highly encoded communicative systems. Linguistics has contributed to ignorance about sign languages when it has accepted an evolutionary view of human vocal and auditory organs but has called on a creation myth to account for speech and language. Not all linguists are so dualistic. Hewes, Kendon, Kavanagh, Liberman, Sarles, Wescott, and others have attempted to look at language as brain function with both limbic and vocal involvement, in recent meetings of the American Anthropological Association, the IXth International Congress of Anthropological and Ethnographical Sciences, conferences of the National Institute of Child Health and Human Development, and the New York Academy of Sciences. A promising lead which may be empirically testable is that the gestural signal and not the all-at-once vocal signal (as in bird song) used by bipedal primates first divided into partials with nominal and verbal referents. (Author)

****
* Documents acquired by ERIC include many informal unpublished *
* materials not available from other sources. ERIC makes every effort *
* to obtain the best copy available. Nevertheless, items of marginal *
* reproducibility are often encountered and this affects the quality *
* of the microfiche and hardcopy reproductions ERIC makes available *
* via the ERIC Document Reproduction Service (EDRS). EDRS is not *
* responsible for the quality of the original document. Reproductions *
* supplied by EDRS are the best that can be made from the original. *
****

ED117979

Paper presented at APA, Chicago, 30 August 1975, symposium:
Chimpanzees and Sign Language: Implications and Perspectives

SIGNING APES AND EVOLVING LINGUISTICS

William C. Stokoe

If evolution proceeds generally by adaptation of a species to new conditions and the natural selection of those characteristics which enhance the adaptation, the metaphor implied in "evolving linguistics" may be useful. "Signing apes" of course present the new conditions which are confronting linguistics. Whether linguistics will survive, adapt, and emerge in a new form or become extinct as a viable member of the intellectual kingdom remains to be seen by some future observer. We can at least take a hard look at both the endangered organon and the new conditions.

Like anatomical form, a body of thought reveals its antecedents. That which now goes by the name of linguistics was first wholly theological, later humanistic, and in its present amphibious lifestyle divided between humanism and science.

The association of the word (logos) with transcendent diety and the rise of a powerful priesthood sharing rule with an "absolute" monarch (as tribal society developed into "great" civilization) led irresistably to the one essential condition for a proto-linguistics--the invention of writing. As it happened, the longest uninterrupted sequence from tribe to empire and the clearest case of priestly control of language,

FL007447

U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
NATIONAL INSTITUTE OF EDUCATION
THIS DOCUMENT HAS BEEN REPRODUCED EXACTLY AS RECEIVED FROM THE PERSON OR ORGANIZATION ORIGINATING IT. POINTS OF VIEW OR OPINIONS STATED DO NOT NECESSARILY REPRESENT OFFICIAL NATIONAL INSTITUTE OF EDUCATION POSITION OR POLICY

"PERMISSION TO REPRODUCE THIS COPYRIGHTED MATERIAL HAS BEEN GRANTED BY
William C. Stokoe
TO ERIC AND ORGANIZATIONS OPERATING UNDER AGREEMENTS WITH THE NATIONAL INSTITUTE OF EDUCATION. FURTHER REPRODUCTION OUTSIDE THE ERIC SYSTEM REQUIRES PERMISSION OF THE COPYRIGHT OWNER."

the Egyptian, just missed the invention of a system of writing directly related to the essential sounds of speech. It was in India that some of the earliest and still recognizable evidence of linguistics appeared.

Centuries later, linguists had extended their scope, no longer subsisting only on sacred writings of the past but dealing with language itself--though until the last century, still with official texts, language preserved in respected writings. A little later, protolinguistics, otherwise grammar and philology, became linguistics when it shifted to live language in speech, and away from language preserved in writing. Nevertheless, in the long period from Pānini to the present, linguistics, like contemporary biclogical forms, has kept clear morphological evidence of its past existence.

The whole course of linguistic development shows two major phases. It began as examination of language, because language was the vehicle carrying God's word to man. It became an examination of language as the exclusive and unique behavioral possession of the human species. No longer exclusively devoted to the explication of holy writ, linguistics still inhabits the dualistic world of teleological myth: man speaks and understands; the rest of creation does not, because it works by natural law.

In our time there have been indications that individual linguists might emerge from the environment of miracle and come to treat language as wholly natural; but at the present moment linguistics itself

is largely amphibious. The physiological processes of speech production are recognized as complex nervous and muscular activity organized and directed by part of the left side of the brain; but they are seen also as one part of a larger system, which includes syntax and semantics as miraculous givens unaccounted for by natural evolution from any primatoid origin.

This brings us to the exact moment of this symposium, "Chimpanzees and Sign Language: Implications and Perspectives." The implication is strong in what has happened recently that linguistics has remained too long a kind of human apologetics, unable to escape its theological and exigetical past. And one perspective which opens shows linguistics becoming a modern biological science, seeking natural, not supernatural, explanations of the workings of language as a species of the genus communication.

If the change in linguistics does occur there can be little doubt that the conjunction of chimpanzees and sign language gave the impetus. Both chimpanzees and sign languages have been in the intellectual environment for a long time, largely unnoticed by linguistics. But when the Gardners began to teach Washoe signs and Washoe began to use them as if they were language symbols the implication and the perspective became clear. Molecular biology shows the brain cells of chimpanzee and man no great genetic distance apart. Artificial languages with palpable symbols and carefully invented syntax and limited

semantics have enabled a few chimpanzees to show us the correctness of the biologists' findings. Premack has suggested operational testing for substitutability of symbols inside and outside of language (1975). But, in work with a natural sign language (no matter how imperfectly ASL was represented in the first structural description and the early dictionary), the Gardners, Fouts, and other experimenters have hit on more than a good element of research design; they have used a highly interesting but little known linguistic system. Other experiments test the presence of specific capabilities for language: symbolic reference (naming), and combination of symbols (syntax). Experiments with sign language escape the confines and limitations of the white room by bringing the chimpanzees into playful and life-supportive interaction with other primates. Thus the observed behavior of these animals encompasses actual communication rather than responses to elaborate testing. Communication instead of response reveals more than was known about sign languages and so puts linguistics to the test.

Along with a proper skepticism about chimpanzee language competence, some observers have revealed unnecessary ignorance of the nature of a fully developed sign language (Stokoe 1974a). Linguistics has contributed to such ignorance by accepting an evolutionary view of vocal and auditory apparatus in man but calling on a creation myth to explain speech and language. Not all linguists adopt this dual view,

and to see in prospect a much broader linguistics in the twenty-first century only requires notice of some small but prophetic activities recently prompted by signing chimpanzees.

Hewes began it by reopening the question of language origins; his study of the whole subject, his arguments, and his theoretical outline were first presented to anthropologists (Hewes 1973a, 1973b, 1974, in press). The immediate reaction was instant division. With Hewes were ranged many biological, ethological, social, and cultural anthropologists; against his view were physical anthropologists reluctant to reclassify data and linguists unwilling to question authorities who said that nothing of importance could be learned about the origin of language.

Nevertheless, at the meeting of the American Anthropological Association in Toronto, November-December 1972, Wescott organized a symposium on the topic; and, after Hewes presented the case for a gestural role in the origin of language, four other papers and seven formal discussants as well as a roomful of interested participants addressed the topic (Wescott 1974). In the present symposium an appropriate abstract of that 1972 meeting might read: "A chimpanzee's use of signs from American Sign Language makes imperative a re-examination of language origins and evolution." That is, linguistics must broaden its scope to include at least as much communicative behavior as can be seen when deaf persons are conversing in sign language and must redefine language abstractly enough not to confuse transmission-reception

systems with language itself.

Less than one year later, at the IXth International Congress of Anthropological and Ethnographical Sciences in Chicago, Kendon, Key, and Harris, arranged a conference on "The Organization of Behavior in Face-to-Face Communication." In the context of the implications and perspectives we are considering, it was significant to hear at that conference the two themes just stated re-enforced; e.g. Yngve argued for a broader linguistics, a science that would not exclude as its matter so much of what we reluctantly called there nonverbal behavior. Sarles, in calling for a human ethology, charged linguists with ignoring some of the loudest parts of spoken communication. In fact, consensus was reached that data for definitive studies of language acquisition must include both sight and sound recordings of infants' interaction with others.

In the autumn of 1973, Kavanagh and Liberman convened a conference on "The Role of Speech in Language" (Kavanagh and Cutting 1975). Again the proceedings indicate very clearly the direction that linguistics may be taking. One question Liberman asked the group of twenty-two as he opened the conference was this:

> And when we look most generally at the more abstract components of spoken language--phonology, syntax, and semantics--do we see any formal resemblances to speech or any other evidence of accommodation to the limitations of the vocal tract and the ear? (K & C 1975:6).

This question and three hundred pages of proceedings show that some linguists are ready to look at very recent events involving, it may be, chimpanzees and sign language, and probe into the basic tenets of the discipline.

By design a number of disciplines were represented at the conference: anthropology, behavioral sciences, communication arts and sciences, education, linguistics, and psychology among them. Of the twenty-two participants at least seven are primarily linguists and nine or ten more might be called psycholinguists, i.e. psychologists primarily concerned with language and language-related behavior. The deliberation of this conference foreshadowed the direction linguistic endeavors may take.

To look at more specific matters, consider these points made by Marler, examining animal sounds as possible origins of speech:

> Thus a bird alarm call is at once a symbol for a predator and a directive to escape. The "rough grunting" of chimpanzees announces the discovery of food and also invites others to come and share. This incorporation of noun and verb functions in the same indivisible signal greatly limits the possibilities of syntactical rearrangements of sounds to create new messages (in K & C 1975:34).

Exactly. Nothing in contemporary linguistics nor in animal communication studies explains or tries to explain how noun and verb functions were first differentiated so as to be productively combinable. But as Sarles says, "The underlying problem has been poorly conceptualized"

(in Wescott 1974:80). He sees speech and gesture as "part of the substance of interaction in all the social species including Man" (ibid.).

As Marler states the problem, it does seem insoluble--to divide indivisible signal into noun and verb functions requires language, but where would language come from if chimpanzees were at the top of the phylogenetic tree? One possibility is that it was not the all-at-once vocal signal but the gestural signal that cracked. From a mass of varied evidence, Hewes supposes that hominids began to use hands for particularized interaction at the same time they began more particularized tool fashioning and use than was habitual in primates. As I said in the Toronto symposium (Wescott 1974:35-68), this fertile supposition leads to exploration of how a primate's gSign (gestural act as sign in a semiotic system) can divide.[1] Bipedal, erect, binocular-sighted primates--unlike mammalian quadrupeds exhibiting "pointing" behavior--can simultaneously see both a gSign and what it points at. Semiotically considered, the first step then could be the separation of the index or pointing gSign from its referent--and Washoe's use of both pointing and a name sign, YOU+SUSAN, suggests that a chimpanzee can separate more than that. In psychological terms, this same first step might be interpreted as the separation

---

[1] Trần Dûc Thảo (1973) argues that language can be derived by elaboration of the basic deictic gesture--pointing at things and actions (Gordon Hewes, personal communication).

of gSign as symptom (pointing behavior) from total affect (e.g. a deer's pointing of head at a scent, sight, or sound and its complete readiness to flee or remain quiet). At any rate, once a gSign and its referent (or the animal's attention on an object or action outside itself) become two phenomena instead of one in the vision of the gSign's maker, the semiotic system, like a fertilized cell, may grow by continued division.

Here we enter conjecture, but from it may grow ideas to be tested in further experiments with chimpanzees and sign language. Whether the gSign took on noun functions after countless pointings at other individuals and at things, or became verb after being pointed at actions or events, none of us can say; though one of the chimpanzees in Nevada or Oklahoma or one still unborn may show us. Nevertheless, once gSigns became symbolic, as signs separated from designata, the use of such signs might lead to a further cognitive step, that in which some similarity of a gSign and its referent is perceived as resemblance; and so lead to sign as icon (Greenlee 1974:51-98; Stokoe 1975:107). Again we do not know whether iconic gSigns designated verbs through resemblance of the sign activity to something in the verbal appearance (Chafe 1972; Stokoe 1974[b]:51-68), or designated nouns through similarity of the sign formations to nominal appearances. We have no evidence yet, but instead of a complete lack of explanation (some linguists insist that we should not even look for explanation), we do have elements for several hypotheses which may become testable.

It is not difficult to find in the animal world gSigns that denote events which require both nouns and verbs to describe. It should be possible also, with a proper conceptualization of the problem, to look again at the activities of the present generation of signing apes to see if indeed noun and verb functions are separated and new messages are thus created. Each time I see films of Washoe, I find new things to wonder at; the most recent viewing impressed me most at the point where Washoe is performing least rapidly, with least habituation, but with immense concentration shown by uncharacteristic cessation of other activity. She begins with something like YOU + ME . . . Prompted, she repeats and expands to some combination of these four signs: YOU + SUSAN + ME + WASHOE . . . Again there is hesitation, but no quick escape from the spot or switch of attention to something else. When the operative sign GO-OUT finally emerges, I am ready to believe I have been watching the outside of something which viewed internally is called thought. Dogs and other pets have learned ways of signalling to master or mistress, 'Let's you and I take a walk outside;' but it looks very much as if Washoe's silent struggles are occasioned by the necessity of finding the correct verb phrase to go with the compound noun phrase she much more easily produces.

NOTE

The support of NIH and NSF grants (NS-10302 and SOC-7414724) is gratefully acknowledged.

REFERENCES

Chafe, Wallace L.
1972MS The Linguistic Expression of Experience, Lecture at Georgetown University.

Kavanagh, James F., and J. E. Cutting, eds.
1975 The Role of Speech in Language (Cambridge MA, MIT Press).

Kendon, Adam, M. R. Key, & R. E. Harris
1975 The Organization of Behavior in Face to Face Behavior (The Hague, Mouton).

Greenlee, Douglas
1974 Peirce's Concept of Sign (The Hague, Mouton) (=Approaches to Semiotics, ed. Sebeok, Paperback Series 5).

Hewes, Gordon W.
1973a Primate Communication and the Gestural Origin of Language, Current Anthropology 14, 5-24.

1973b An Explicit Formulation of the Relationship between Tool-using, Tool-making, and the Emergence of Language, Visible Language 7, 101-127.

1974 Language in Early Hominids, in Language Origins, ed. Wescott (Silver Spring MD, Linstok Press), 1-34.

in press Language Origins: a Bibliography (The Hague, Mouton).

Premack, David
1975 Symbols Inside and Outside Language, in The Role of Speech in Language, ed. Kavanagh & Cutting (Cambridge MA, MIT Press), 45-62.

Stokoe, William C.

1974a The Classification and Description of Sign Languages, in Current Trends in Linguistics, ed. Sebeok (The Hague, Mouton) 12(1):345-371.

1974b Appearances, Words, and Signs, in Language Origins, ed. Wescott (Silver Spring MD, Linstok Press), 51-68.

1975 Review of Greenlee, Sign Language Studies 6, 104-108.

Trân Dûc Thâo

1973 Récherches sur l'Origine du Langage et de la Conscience (Paris, Editiones Sociales).

Wescott, Roger W., ed.

1974 Language Origins (Silver Spring MD, Linstok Press).